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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,319	11/17/2003	Fred D. Lang	11700	5085
40088	7590	10/03/2005	EXAMINER	
FRED D. LANG 12 SAN MARINO DRIVE SAN RAFAEL, CA 94901			BARBEE, MANUEL L	
			ART UNIT	PAPER NUMBER
			2857	

DATE MAILED: 10/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/715,319

Applicant(s)

LANG, FRED D.

Examiner

Manuel L. Barbee

Art Unit

2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION:

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-76 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-22 and 47-76 is/are allowed.
- 6) ☒ Claim(s) 1-4 and 23-43 is/are rejected.
- 7) ☒ Claim(s) 44-46 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6/15/05.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Terminal Disclaimer***

1. The terminal disclaimer filed on 8 September 2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US Patent No. 6,522,994 has been reviewed and is accepted. The terminal disclaimer has been recorded.

### ***Double Patenting***

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-4 and 23-43 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 and 23-43 of U.S. Patent No. 6,651,035 in view of Nevruz (US Patent No. 5,847,266). The claims of the '035 patent teach most of the limitations of the present application. Claims 1 and 2 of the present application correspond to claims 1 and 2, respectively, of the '035 patent. Claims 3 and 4 of the present application corresponds to claims 4 and 3, respectively of the '035 patent. Claims 23-43 of the present application correspond to claims 23-43 of

Art Unit: 2857

the '035 patent. The claims of the '035 patent teach quantifying the operation of a fossil-fired thermal system but not specifically the operation of a recovery boiler burning black liquor as shown in the claims of the present application. Further, claims 1-4 of the '035 patent teach solving for the tube leakage in moles using a molar base while the present invention have no limitations for using moles or a molar base. Nevruz teaches recovery boiler leak detection (Abstract, col. 1, lines 13-20; col. 4, lines 38-52). Nevruz does not teach limiting the determination of tube leakage to moles (col. 1, line 61 - col. 2, line 54). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of the '035 patent, to include quantifying the operation of a recovery boiler, as taught by Nevruz, because then an accurate method for quantifying the operation of the recovery boiler and detecting leaks would have been available (Nevruz, col. 1, lines 13-30).

***Allowable Subject Matter***

4. Claims 44-46, 49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
5. Claims 5-22 and 47-76 are allowed.
6. The following is a statement of reasons for the indication of allowable subject matter: None of the prior art teaches a method for quantifying the operation of a recovery boiler burning black liquor fuel that includes developing a mathematical model of the combustion process, selecting a set of minimization techniques applicable to the recovery boiler and a set of routing inputs and convergence criteria to the minimization

Art Unit: 2857

techniques, selecting a Choice Operating Parameter of tube leakage flow rate, selecting a set of Choice Operating Parameters, determining a set of System Effect Parameters applicable to the recovery boiler, determining a set of Reference System Effect Parameters, determining an objective function, which allows minimization of differences between the set of System Effect Parameters and the set of Reference System Effect Parameters and determining the tube leakage by minimizing the objective function and reporting the tube leakage flow rate, as shown in claim 5.

None of the prior art teaches a method for quantifying the operation of a thermal system burning fossil fuel that includes selecting one of the Input/Loss methods, selecting a set of effluent concentrations associated with the thermal system based on available instrumentation resulting in a set of available plant effluent concentrations, obtaining a ratio of effluent concentrations based on an effluent concentration obtained before the air leakage and on an effluent concentration obtained after the air leakage and establishing an air pre-heater leakage factor which describes the effects of the air leakage into the thermal system based on the obtained ratio, as shown in claim 17.

None of the prior art teaches a method for quantifying the operation of a thermal system burning a fossil fuel that includes developing an explicit mathematical model of the combustion process before online operation, operating online while using the explicit mathematical model, measuring a set of measurable operating parameters, including at least effluent concentrations of oxygen and carbon dioxide, downstream of the heat exchangers/combustion region of the thermal system, obtaining an effluent concentration of water if reference fuel characteristics indicate fuel water is not

Art Unit: 2857

predictable, obtaining an air pre-heater leakage factor and calculating fuel chemistry as a function of the explicit mathematical model of the combustion process, the set of measurable operating parameters, the obtained effluent water and the air pre-heater leakage factor, as shown in claim 47.

None of the prior art teaches a method for quantifying the operation of a recovery boiler burning black liquor fuel that includes obtaining reference fuel characteristics while off-line, obtaining current measurements of the system's operating parameters while off line and while online performing the steps of measuring the useful output of the system, obtaining fuel data and characteristics, introducing fuel concentrations and heating values to a mathematical model of the recovery boiler, obtaining routine systems operational parameters, obtaining values of the effluents oxygen, carbon dioxide, water and SO<sub>2</sub>, obtaining air pre-heater leakage and dilution factors, computing molar moisture-ash-free fractions of fuel carbon and fuel water as explicit stoichiometric solutions, finding the molar moisture ash-free fractions of fuel nitrogen, oxygen, hydrogen, sulfur, sodium, potassium and chloride, converting the molar moisture-ash-free fuel concentrations to a molar dry base and executing the mathematical model to determine the As-Fired fuel flow, effluent flow, emission rates, boiler efficiency and overall system thermal efficiency, as shown in claim 50 or similar limitations found in claim 53.

### ***Response to Arguments***

7. Applicant's arguments filed 8 September 2005 have been fully considered but they are not persuasive. Claims 1-7 and 10-43 were rejected under the judicially

Art Unit: 2857

created doctrine of obviousness-type double patenting over claims in US Patent No. 6,651,035 in view of Nevruz (US Patent No. 5,847,266) in the Office Action mailed 7 April 2005. Further, in the same Office Action, claims 47, 48, 50-53, 56 and 58-68 were rejected under the judicially created doctrine of obviousness-type double patenting over the claims of US Patent No. 6,522,994 in view of "Performance Test Procedure: Sodium Based Recovery Units" (APPI Press, Atlanta Georgia). Applicant filed a terminal disclaimer for US Patent No. 6,522,994 on 8 September 2005. It appears that Applicant believes that the terminal disclaimer to the '994 patent obviates all double patenting rejections; however, the terminal disclaimer only obviates the double patenting rejections to claims 47, 48, 50-53, 56 and 58-68. An additional terminal disclaimer to the '035 patent would obviate any remaining double patenting rejections based on the '035 patent (See MPEP 804.02, subheading IV. Disclaiming Multiple Double Patenting References).

Amendments to claims 5 and 17 have overcome the nonstatutory double patenting rejections to claims 5-7 and 10-22.

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

Art Unit: 2857

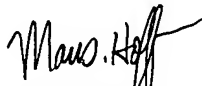
shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manuel L. Barbee whose telephone number is 571-272-2212. The examiner can normally be reached on Monday-Friday from 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on 571-272-2216. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mlb  
September 26, 2005

  
MARC S. HOFF  
SUPERVISORY PATENT EXAMINER  
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